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## SECRET/SECURITY INFORMATION

not the direct responsibility of the driller. However, that pressure limit was exceeded at times and if any damages or 50×1 accidents ensued, the driller was held directly responsible and any damages were deducted from his pay.

allowed eight months by the government to drill and finish one well. Barring any unforseen difficulties, such as drill breaks and abandonment of the site, we could finish in the alloted time. On very rare occasions, finished a well before the dead line and then received a small bonus.

(b) Rotary method. this method used the same basic equipment and operated in the exact same manner with the 50X1 exception that the rotary table and the entire drill column from the top to the extreme bottom, rotated during the drilling operation.

5.

One of the major differences between the two methods was that the turbine method was more economical than was the rotary method. In the turbine method, only two Diesel engines had to be operated all the time (those engines which pumped the mixture) whereas four Diesel engines had to be operated all the time in the rotary method. In the rotary method, two engines pumped the mixture both ways, the third supplied the power for the drilling and the fourth operated the winch. It was also a more economical and beneficial method because fewer drill breaks and other slowing down procedures occurred since the entire drill column turned; during the turbine method of operation, the drill solumn did not turn but was held stationary; only the drill bits turned. Another feature which favored the turbine method over the rotary method was the 50X1 fact that the turbine operation was faster. In eight hours of operation, the turbine method doubled the depth obtained in the same time of rotary operation.

3.

The electricity that was produced was used explusively for lighting purposes. My engineer instructor mentioned the fact that electricity was used for powering the drill at some fields in the USSR. I can not offer any further information regarding electric power drilling. At the field where I worked, only the above mentioned methods were employed.

4.

(a) The rotary table. /See Erotosure (4) The rotary table consisted of a circular steel table approximately 1.5 m in diameter, 50 as thick with two parts, each part subdivided into two sections that were removable. From the center of the table, one of the removable parts had an approximate radius of 10 as. This section was the drive joint. The other removable part was approximately 40 cm The remaining 15 cm was secure. This table, (the entire arrangement rotated during rotary operation but remained motionless during turblue operation.

# SECRET/SECURITY INFORMATION -3-

- (b) Pipe tongs. See Enclosure (B). These were all metal pipe-wrench-like instruments that were used for tightening and untightening the pipe sections. None of the drill column pipe sections were hand carried; but were lifted and carried to the derrick with the aid of a cable and winch.
- (c) Turbine drill bits. See Enclosure (AV. These drill bits were constructed of hard steel and formed a triangle. At the corners was attached a ball-like structure with sharp, jagged edges. These drill bits ranged from 5.75 cm to 25.75 cm in size. During turbine operation, only the ball-like structures rotated in the manner described above.
- (d) Rotary drill bits. See Enclosure (A). These bits were identical to those utilized in turbine operation with the exception that the entire assembly rotated.
- (e) Draw-works or winch. The winch was operated by a Diesel engine which was located next to the Diesel engine which supplied the drilling power. It was approximately a 400 horsepower Diesel engine. The cable was approximately an inch and a half thick and was wound around a steel cylinder attached to the engine and had lines leading to the top of the derrick.
- (f) Casing pipe program. Steel smokestack pipe of three different sizes was used for the casing program. When the drilling reached the 100 m level, a 50 m length of pipe, approximately 50 cm in diameter, was sunk and packed with cement. At the 300 m drilling level, 150 more meters was cased with pipe approximately 40 cm in diameter and packed with cement. Again, at the one thousand m drilling level, 800 more meters was cased with pipe approximately 30 cm in diameter and packed with cement. From that point, the drilling proceeded without any casing.
- (g) Swivel and hook. See Enclosure (c). The swivel and hook was suspended by a block and tackle from the top of the derrick. The uppermost block consisted of five wheels and the lower block had four wheels. The steel hook, approximately 30 cm long, was attached to the lower block from which the swivel was suspended. The all steel swivel was approximately one m long and 80 cm wide at the widest point. At the base of the swivel, the top portion of the drill column to which the pipe sections were connected) was attached in such a way where in only that portion of the swivel rotated.
- (h) Kelly pipe joint. See Enclosure (DV. This drive joint was constructed of steel in such a manner that it fitted snugly, around the rectangular portion of the drill column which was extended from the swivel hook, passed through the rotary table and attached to the circular drill pipe section. That rectangular portion of the drill column, was approximately seven m long and was always within the opening of the rotary table. Those portions of the rotary table /Foint #1, Encl(D) fitted snugly, on all sides of the rectangular section of the drill column. When the limits of the rectangular portion of the drill column had been reached and it became necessary to withdraw the entire drill column to such an extent as to enable the addition of a new pipe section, these pieces automatically lifted out with the withdrawing action. After the pipe section had been attached, the rectangular portion of the drill column was replaced in the opening, the drive joints /Foint #1, Encl(D) were replaced by hand and the drilling was resumed.

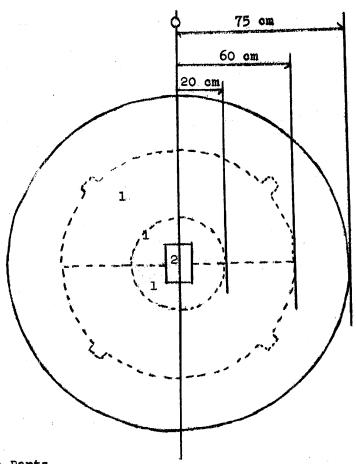
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Enclosure (A)

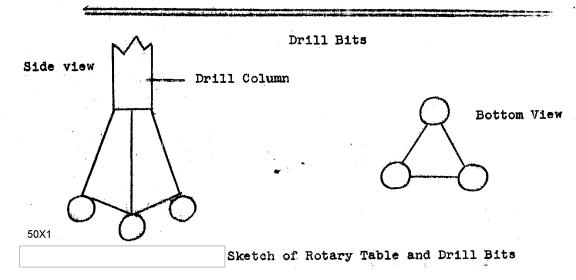
SECRET/SECURITY INFORMATION

#### Rotary Table



#### 1. Removable Parts

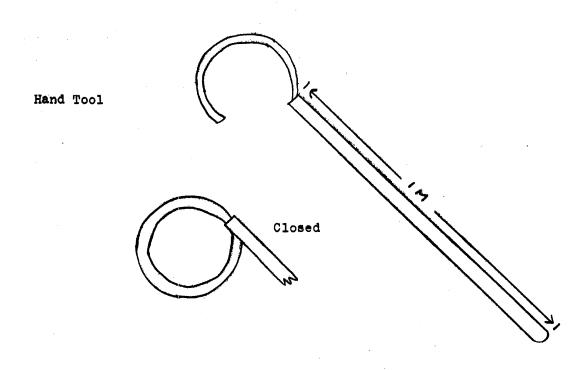
### 2. Opening



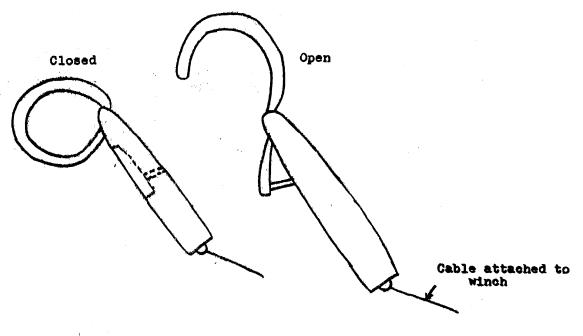
Enclosure (B)

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50X1

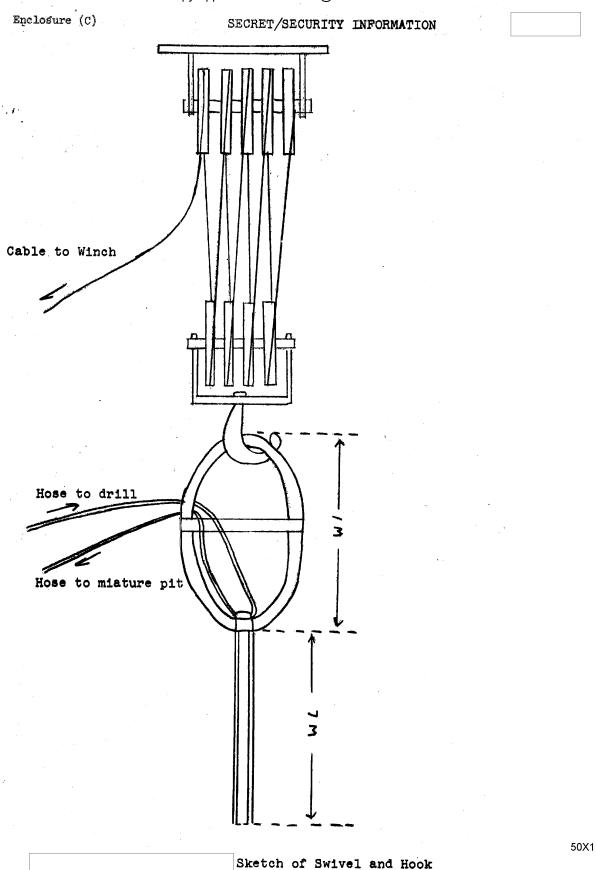


#### Machine Tool



50X1

Sketch of Wrench-like Instruments (pipe tongs)



Enclosure (D) SECRET/SECURITY INFORMATION 2 Drive Joint 3 Rotary Table Rectangular portion of drill column

Sketch of Drive Joint (cross-sectional view)

50X1